DCPP
Neonatal chapter

Background

At the meeting in Venice where trends 1990-2000 in child mortality were discussed, attention was drawn to the fact that there is limited focus in the planned content of the DCPP2 book regarding neonatal and fetal outcomes. A number of points were agreed as follows

1. Size of burden
   - Large number of neonatal deaths, 36% of U% deaths (~ 3.94 million neonatal)
   - Large number of late fetal deaths (new WHO estimates for late fetal deaths ~2.77 million)
   - Disability burden

2. Time trends will ensure increasing proportion of under-5 deaths in neonatal period. Failing to address this clearly is taking a 1990's agenda for child survival and will date the priorities in DCPP2.

3. While interventions and cost analysis to address fetal and neonatal survival are linked to approaches addressing maternal outcomes, the fetal/neonatal outcomes and cost-benefit do differ in intervention, cost and outcome. For example tetanus toxoid coverage to prevent neonatal tetanus is measuring a different outcome, compared to preventing maternal tetanus. The same intervention such as Caesarean section may be done for maternal indications (for example eclampsia) or fetal indications such as breech, with differing prevalence, preventive fractions and levels of coverage. The benefits of some interventions such as neonatal resuscitation, Kangaroo Mother Care, breastfeeding are specific to the neonate.

4. Successful reduction of neonatal mortality requires multiple linkages along the continuum of care, particularly with Safe Motherhood programmes but also with material covered in other DCPP chapters such as
   - IMCI
   - EPI
   - Nutrition/breastfeeding
   - Malaria

Given the size of the problem, the range of interventions and the need for multiple linkages there seems too much to cover coherently in one maternal/perinatal chapter without taking attention either from the woman or the fetus/newborn.

The editors (Dean Jamieson and Anthony Measham) are willing to give more visibility to those issues. The agreed approach is to:

1. provide additional support/inputs for the maternal chapter (which would then be given more length by the editors)

2. write a short chapter that would cover issues linking the maternal and other chapters, and covering specific interventions with evidence such as Kangaroo Mother Care.

Proposed Timeline

Task	**Person(s)**	**Timing**
Define contents • To be added/emphasized in maternal/perinatal chapter • To be included in Neonatal chapter Detailed annotated outline identifying existing work that can be added and key new tasks, allocation of tasks	Aberdeen team Lawn and Zupan DCPP input (Dean's visit to London and Geneva)	End of March
Working on first draft Continuing coordination with Aberdeen team Consider additional author at this point depending if this will speed up necessary new work or not	Lawn and Zupan	Early April
First draft of neonatal chapter to send to Aberdeen team and selected reviewers (to be decided on)	Lawn and Zupan Input from Aberdeen team and DCPP	Early May
Draft to be submitted to DCPP (note review and linkages with other chapters may be ongoing in view of very short timeline)	Lawn and Zupan	End of May

Draft outline
Authors: Joy Lawn, Jelka Zupan, other(s)?

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Section 1. SCOPE/ EPIDEMIOLOGY

1. 1 Overview of numbers of NNDs and SBs [1]

- MDGs, Trends in rates by time period, the increasing importance of the neonate
- Terminology – epi versus programmatic [Side box re defns and time period]
- Limitations of data
- Deaths by time period (intrapartum, first day, first week)
- Deaths by place (geography (note WB regions) and where in health care system)
- Morbidity/disability data – comments on importance but limited data availability

1.2 Causal frameworks [1]

- Direct causes of neonatal death (preterm birth, "asphyxia", NNT, severe infection, diarrhoea, congenital, "other")
- Underlying (BWt/ Gest age, maternal conditions)
- Fundamental (poverty/SES quintiles, female literacy etc)

1. 3 Lessons from the epidemiology to apply to programs

- Dyad, link with maternal outcomes and health, life cycle approach
- Priority of intrapartum period yet continuum of care,
- Countries/regions with highest burden should receive most support for country level decision-making and action as epidemiology (especially cause-specific neonatal deaths) and existing capacity varies so national plans must be individualized
- Pro-poor necessity
- Health system requirements, yet avoidance of over-medicalization
- Side boxes on historical and contemporary lessons

Given the tight timeline for this chapter, multiple works in progress would need to be incorporated rather than attempting new epidemiological reviews. Fortunately there are multiple works just nearing completion. Sources for epidemiology would include:

- *WHO envelope estimates (WHO RHR, Zupan et al)*
- *CHERG all cause neonatal cause specific models (CHERG neonatal team, Lawn et al)*
- *IMMPACT/SNL SB rate review (IMMPACT /SNL/ ICH/ JHU consortium)*
- *Asphyxia GBD estimates (Lawn et al with EIP)*

[1] Exact content here will depend on what is covered is Maternal/perinatal chapter and what is to be covered de novo here. Guideline discussed is that Wendy will include Fetal outcomes in Mat/perinatal chapter and give numbers of NNDs, but detail of NNDs will be dealt with here

- Analysis of NMR by SES and by urban/rural for 82 surveys (Lawn et al for SNL/HNP 2004)
- Previous work by Lawn et al in Healthy Newborn Manual

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Section 2. INTERVENTIONS, EVIDENCE, CURRENT COVERAGE AND COST TO SCALE UP

2.1 Introduction

- Life cycle and continuum of care by time period
  - Biological
  - Behaviour change approaches (age at first pregnancy, smoking)

- Health system
  - Continuum of between home and health system
  - Supplying a composite systems interventions
  - Generating demand

2.2 Methods for data searches and synthesis

Report systematic searches as carried out for specific topics:

- Neonatal resuscitation
- Meconium staining
- Cord care
- Cord clamping
- Handwashing *
- Breastfeeding * (hopefully enough secondary material to avoid rpting this)
- Warmth*
- Vitamin K to neonate
- Vit A postpartum to mother, neonate, LBW infant*
- Package of extra care for LBW babies (identification, increased support, early treatment infections) *
- KMC* (hopefully enough secondary material to avoid rpting this)
- Perinatal Audit

List based on those we have done recently and those we consider to be priorities
** To be done or repeated more systematically for this chapter*
Rest already done by Joy or Jelka recently

Grades of recommendation adapted from Oxford Center for EBM grades of recommendation:
A = meta-analysis or at least one good RCT
B = well conducted clinical studies no RCT
C = some descriptive evidence and expert committee consensus
A* = unethical to test rigorously and widely practiced as std

eg blood transfusion, neonatal resus (category added by JL)

Avertable burden to be estimated for each of the selected interventions

2.3 Specific interventions by time period (spilt by basic, additional and situational)[2] and then cross-cutting interventions.
Overview with summary table of all the linking packages and interventions across the time periods that relate to neonatal survival, with Oxford EBM Recc Grade. This summary table will aim to pull all together in context and maintain links with mother and with child. More detailed assessment of interventions will be restricted to neonatal interventions after birth and highlighted in bold in list below.

Have marked in bold those that seemed to stand out in our conversations so far as our priorities. If we can fix on priorities within next week then can start to collect existing materials and do new searches as needed. From reading the DCPP author guidelines we need to estimate the following for each of these selected interventions:

1. *level of evidence*
2. *avertable burden (preventive fraction)*
3. *current level of coverage (by sub region??)*
4. *cost to scale up to say 90% coverage*

- Intrapartum at delivery/ Immediate postpartum
    - **Newborn resuscitation** (review of components in Asphyxia lit review, can expand on this)
    - Meconium staining of liquor mx (Weissman review)
    - Immediate cord care (Zupan Cochrane review) *(include as priority??)*
    - **Warmth**

- Postnatal /newborn period
    - Essential care
        - **Handwashing** (Zulfi's review, CAH doc, add own searches)
        - **Breastfeeding,**
        - Ongoing cord care (Zupan Cochrane review)
        - Avoidance of hypoglycaemia (update on review of "evidence" for WHO?)

[2] Exact content here will depend on what is covered is Maternal/perinatal chapter and what is to be covered de novo here. Attempt "line in sand" at time of delivery as per Email on Friday

- Immunization (Hep B, BCG – brief and cross ref to EPI chapter)
- Vitamin K to the neonate (ref Cesar Victora re CE as prevention in transitional settings)
- Vitamin A to the mother (Jelka do you have good review for this?)

– Extra care

- **LBW/preterm, package of extra care for LBW babies (identification, increased support, KMC if indicated, early treatment infections)**
- infants of HIV+ (suggest that we refer most of this to HIV chapter apart from limited discussion of feeding options)
- infants of mothers with TB (suggest that we refer most of this to HIV chapter apart from limited discussion of treatment of infant)
- infants of mothers with syphilis (suggest that we refer most of this to STD chapter apart from limited discussion of treatment of infant, mother, partner)

– Emergency care (major life threatening, common conditions)

- Neonatal encephalopathy Mx (briefly discuss limited evidence for MgS04, phenobarb no evidence, early evidence on head cooling, recommend current priority as prevention and supportive Mx of NE)
- **Neonatal infections/ARI** (recommend priority as prevention strategies and early Mx with antibiotics/ supportive care)
- Congenital abnormalities (recommend prevention of NTDs with folate where feasible, otherwise supportive Mx, (? discuss cleft palate more?))
- Severe jaundice (prevention by anti D, G6PD screening, for additional settings with more capacity, otherwise early identification of severe jaundice and phototherapy, (exchange??) Recommend priority as early detection and phototherapy
- Bleeding (Vit K, timely emergency mx)
  Recommend priority as early detection and mx, Vit K to all LBW infants and consider Vit K for all neonates in transitional countries

- Cross-cutting interventions
    - Training staff (eg distance learning packages in SA?)
    - **Perinatal Audit**
    - **Emergency preparedness by families/communities**

Again there are a number of works that could be drawn upon including:

- *WHO guidelines and packages especially MNP*
- *Community-based interventions trial review (Bhutta et al for SNL/WHO)*
- *IMMPACT / SNL Stillbirth review (Lawn et al)*
- *Asphyxia review (Lawn et al)*
- *Healthy Newborn manual (Lawn et al)*
- *Zupan Cochrane review re cord care*

There is limited data for costs and some new review/analysis may well be necessary. Sources may include:

- *Review of existing cost/impact work at WHO (Matthews, Lincetto, other programmes such as NNT)*
- *Work by Borghi et al in Malawi, Ghana, Nepal*
- *A review funded by SNL for HNP of standardised costing approach for maternal and neonatal studies (Weissman E for SNL)*
- *New work if really necessary/feasible?*

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Section 3. PRIORITIES IN IMPLEMENTATION

4.1 Tabulation of crucial gaps and priorities to scale up

4.2 Estimates of current coverage of selected interventions

4.3 Scaling up – costs and practicalities, pro-poor policies

4.4 Lesson learned

Lesson learned text box re scaling up of skilled attendant training/community MWs with supportive system (maybe Indonesia?)

Lesson learned text box re institution of NRP in province in China

Lesson learned text box re PPIP and use of perinatal data in South Africa

4.5 Actors/Partnerships and approaches, strengths and weaknesses, roles

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Section 4 PRIORITIES IN RESEARCH

6.1 Priority gaps in evidence
Table of key research priorities
Text boxes of examples of new research/partnership approaches

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Section 5. CONCLUSION

MDGs and call to action, synergy of maternal/neonatal solutions, partnership opportunities